

Work Order ID 67057

Monday, March 07, 2011 8:11:52 AM



Page 1

Item ID: D412-664-203

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 3/7/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

u

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr | Revision Nbr | | | | | | | | |
| D412-664-243 | E | | | | | | | | |

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D412-664-203 CHG 006

S u l o s / 24

110

0.00



Packaging

Packaging

Memo

0.00

Packaging

DP

11-3-17

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 1

Bend tube as per Dwg D412-664-243 using CNC bender program 412-aft and Folio FT010

DP

11-3-17

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

8/11/03/17

⑦

140

Crosstubes

0.00



Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 and drill table DT8577 using #9 holes as per QSI 10 to install towers.

2-Ream hole to finish size in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-SCRIBE PART # & BATCH #

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243

SAD
11-03-⑦

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

SAD 11-02-18

Hand Finishing Crosstubes

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

S 4/03/18

Quality Control

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

S 4/03/18

Quality Control

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--|--|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------------|
| 180  Outsource2 | Outsource process - NDT per QSI038 4.1 | 0.00 | | | | | | | |
| | Memo | 0.00 | | | | | | | |
| | Liquid Penetrant Inspection as per QSI 038Or Issue P/O: <u>13081</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order | | | | | | | | <u>CX 11/03/18 ①</u> |
| 190  Packaging | Packaging | 0.00 | | | | | | | |
| | Memo | 0.00 | | | | | | | |
| | Inspect for transit damage Ensure copy of NDT results attached to work order. | | | | | | | | <u>R 4/3/18 ②</u> |
| 200  QC | QC5- Inspect part completeness to step on W/O | 0.00 | | | | | | | |
| | Memo | 0.00 | | | | | | | |
| | Inspect for damage & ensure results are as per Dwg D412-664-203 | | | | | | | | <u>M 11-05 28 ①</u> |
| | Quality Control | | | | | | | | |

Work Order ID 67057

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Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 210 | SprayPaint | 0.00 | | | | | | | |
| | SprayPaint | | | | | | | | |
| Spray Painting | Memo | 0.00 | | | | | | | |
| | 1-Prime inside and outside crosstube as per QSI 005 4.2 | | | | | | | | |
| | 2-Paint outside crosstube with White Imron as per QSI 005 4.2 | | | | | | | | |
| | PRIME: | | | | | | | | |
| | Start Time: 10:00 | | | | | | | | |
| | Finish Time: 11:00 | | | | | | | | |
| | PAINT: | | | | | | | | |
| | Start Time: 3:00 | | | | | | | | |
| | Finish Time: 4:30 | | | | | | | | |
| 220 | QC14- Inspect Spray Paint | 0.00 | | | | | | | |
| | QC | | | | | | | | |
| Quality Control | Memo | 0.00 | | | | | | | |
| | Then, Wrap in plastic bag to protect from scratches | | | | | | | | |

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Stop



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Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

230

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

Assemble as per Dwg D412-664-203

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs

A/R 6398 Magnobond Batch: 116677
Expiry Date: 08/20113-Install clamps as per Dwg D212-664-203 using installation jig DT9024 with 0.010 thick brass shims on both chafing sheild (D3189-1). Torque clamps to 80-100 in lb. 11-03-2411 03 23 (1)

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

Sulost-74(X)

Work Order ID 67057

Monday, March 07, 2011 8:11:52 AM



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Item ID: D412-664-203

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 3/7/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 250 | Pick Kit | 0.00 | | | | | | | |
| | | | | | | | | | |
| Packaging | Memo | 0.00 | | | | | | | |
| Packaging | | | | | | | | | |
| 260 | QC4- 100% Inspect kits for completeness | 0.00 | | | | | | | |
| | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | | | | | | | | | |
| 270 | | 0.00 | | | | | | | |
| | | | | | | | | | |
| Packaging | | | | | | | | | |
| Packaging | Memo | 0.00 | | | | | | | |
| Packaging | Identify and pack for shipping as per PPP D412-664-203 *****Ensure tube is not packaged if curing time is less than 12 hrs, see step 27 for application time & date ***** Time & of packaging: _____ Location: _____ | | | | | | | | |

64/3/24

QD

64/3/24

Work Order ID 67057

Monday, March 07, 2011 8:11:52 AM



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Item ID: D412-664-203

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 3/7/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

U 110328

Picklist Print

Page 1

Monday, March 07, 2011 8:11:48 AM

Work Order ID: 67057

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft


Start Date: 3/7/2011

Required Date: 3/17/2011

Start Qty: 1.00


Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat; Added D3189-1 K/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 06.12.08 per ECN 886 EC
 IPP Rev:H 07-04-30 As per Rev D JLM
 IPP Rev:I 08-06-12 add comment in seq. 21 DD verified by:EC

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|--|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| AN6-40A  Bolt | | Purchased | No | | | 250 | Each | 75.0000 | 4 | 4 | | | |


| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| ST343 | 75 | |
| 112828 | 1 | |
| 115300 | 34 | |
| 115905 | 20 | |
| 116549 | 20 | |

115300

| | | | | | | | | | | | | | |
|---|--|-----------|----|--|--|-----|------|---------|---|---|--|--|--|
| AN6-41A  Bolt | | Purchased | No | | | 250 | Each | 36.0000 | 2 | 2 | | | |
|---|--|-----------|----|--|--|-----|------|---------|---|---|--|--|--|

| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| ST344 | 36 | |
| 113288 | 6 | |
| 115316 | 30 | |

113288 1x
115316 1x

| | | | | | | | | | | | | | |
|---|---------------|-----------|----|--|--|-----|------|--------|----|----|--|--|--|
| AN960JD616  Washer | NAS1149D0663J | Purchased | No | | | 250 | Each | 0.0000 | 18 | 18 | | | |
|---|---------------|-----------|----|--|--|-----|------|--------|----|----|--|--|--|

1115996

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

Picklist Print

Monday, March 07, 2011 8:11:48 AM

Work Order ID: 67057

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft

Start Date: 3/7/2011

Required Date: 3/17/2011

Start Qty: 1.00

Required Qty: 1.00

D2856-600

Manufactured No

230 f

127.6331 1.76 1.76



Abrasion Strip

Location

Loc Qty

Loc Code

| | | |
|-------|----------|--|
| ST | 0.48 | |
| 37668 | 0.48 | |
| ST403 | 127.1531 | |
| 25656 | 1.25 | |
| 26650 | 2.5 | |
| 37668 | 123.4031 | |



11-03-23

D2896-1

Manufactured No

230 Each

13.0000 1 1



Support

Location

Loc Qty

Loc Code

| | | |
|-------|----|--|
| LG | 13 | |
| 47820 | 5 | |
| 58356 | 8 | |



11-03-23

D3189-1

Manufactured No

230 Each

26.0000 2 2



Chafing Shield

Location

Loc Qty

Loc Code

| | | |
|-------|----|--|
| FG | 2 | |
| 36065 | 2 | |
| LG | 24 | |
| 58960 | 4 | |
| 63982 | 20 | |



11-03-23

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Monday, March 07, 2011 8:11:49 AM

Page 3

Work Order ID: 67057

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft

Start Date: 3/7/2011

Required Date: 3/17/2011

Start Qty: 1.00

Required Qty: 1.00

D3595-063-570

Manufactured No

230

Each

56.0000

2

2



RUBBER CUSHION



11-03-23

Location

Loc Qty

Loc Code

FG

4

37971

4

LG

52

42243

31

63406

21

D412-664-203TRN

Manufactured No

110

Each

2.0000

1

1



Crosstube Turning Detail



Location

Loc Qty

Loc Code

LG

2

64740

1

64742

1

MS21042L6

Purchased

No

250

Each

247.0000

6

6



Nut



11-3-11
C413/24

Location

Loc Qty

Loc Code

ST300

247

111578

4

116102

43

116373

100

116548

100

1116373

Monday, March 07, 2011 8:11:49 AM

Shop Packet Print

Page 3

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
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NOTE: Date & initial all entries

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Monday, March 07, 2011 8:11:49 AM

Work Order ID: 67057

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft

Start Date: 3/7/2011

Required Date: 3/17/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased

No

230

Each

98.0000

4

4



Clamp(per MIL-DTL-8783C)



11-03-23

Location

Loc Qty

Loc Code

FG

5

105884

5

LG

93

114749

6

116039

36

116839

51

MS21920-30

Purchased

No

230

Each

98.0000

2

2



clamp(per MIL-DTL-8783C)



11-03-23

Location

Loc Qty

Loc Code

LG

98

109181

36

111258

50

112772

12

Monday, March 07, 2011 8:11:49 AM

Shop Packet Print

Page 4

| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
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| | | | | | | | | |
| | | | | | | | | |

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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

| Item | Qty -243 | Part Number | Description |
|------|-------------|----------------|---|
| 1 | X | D412-664-243 | CROSSTUBE ASSEMBLY (412 HIGH AFT) |
| 2 | 1 | D6009-129 | CROSSTUBE |
| 3 | 2 | D3595-063-570 | RUBBER CUSHION |
| 4 | 1 | D2896-1 | SUPPORT |
| 5 | 2 | D3189-1 | CHAFING SHIELD |
| 6 | 2 | D2856-600-1009 | ABRASION STRIP |
| 7 | 4 | MS21920-28 | CLAMP |
| 8 | 2 | MS21920-30 | CLAMP (OR MS21920-32) |
| 9 | A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE) |

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 47.0 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

| | | | |
|------------|--|--|--------------|
| E | REFORMAT/REVISE GENERAL NOTES; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); ADD TOLERANCE (ZN B6-3, C4-3, C8-3 & C5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4. | RF | 09.09.30 |
| D | REMOVE D2732-058, CHANGE TO D3595-063-570 | PH | 07.03.09 |
| C | REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398, MS21920-32 WAS MS21920-30 | MB | 06.10.27 |
| B | ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIOTUBES | PH | 05.02.04 |
| A | NEW ISSUE | PH | 01.10.17 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | PH | DRAWING NO. | REV. E |
| MFG. APPR. | PH | D412-664-243 | SHEET 1 OF 4 |
| APPROVED | PH | TITLE | SCALE |
| DE APPR. | PH | CROSSTUBE ASSEMBLY (412 HI AFT) | NTS |
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RELEASED
2009-10-29

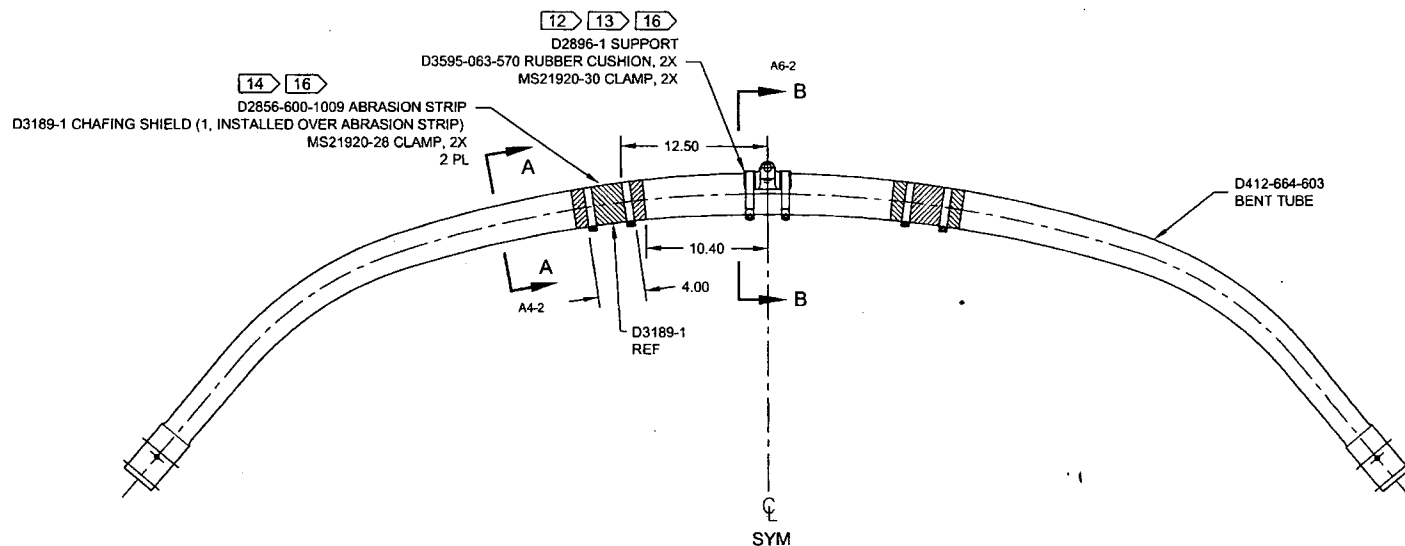
| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

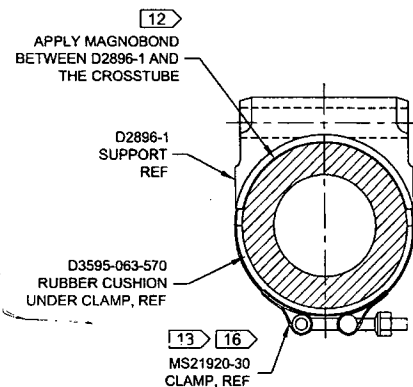
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| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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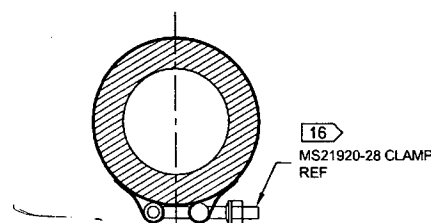
NOTE: Date & initial all entries



D212-664-243
ASSEMBLY DETAIL E



SECTION B-B D4-2
SCALE 4X



SECTION A-A C6-2
SCALE 4X

67057

RELEASED
2009-10-28
MMP

| | | | |
|------------|----------|--|--------------|
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | PS | DRAWING NO. | REV. E |
| MFG. APPR. | PS | D412-664-243 | SHEET 2 OF 4 |
| APPROVED | PS | TITLE | SCALE |
| DE APPR. | PS | CROSSTUBE ASSEMBLY (412 HI AFT) | NTS |
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| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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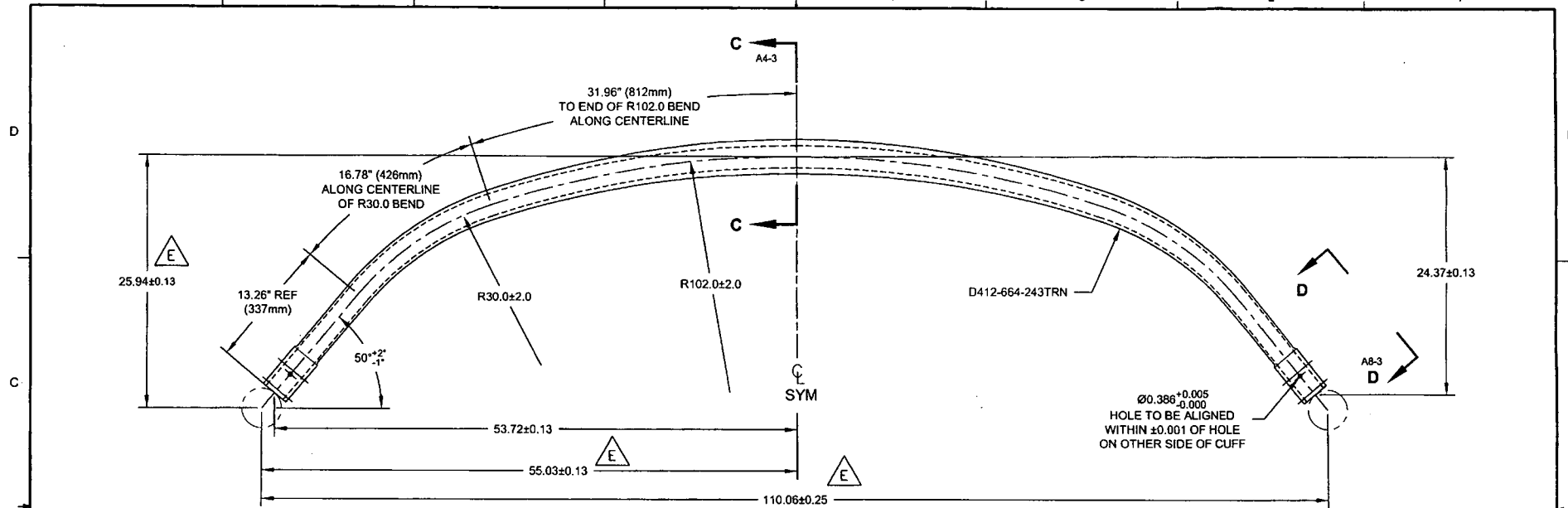
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

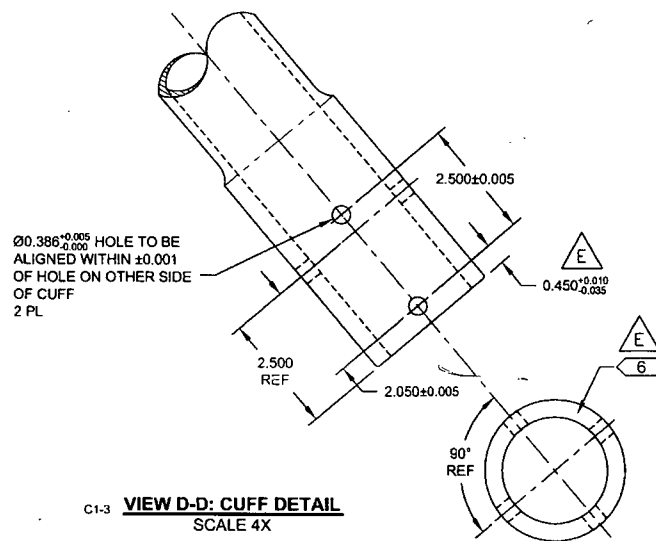
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|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

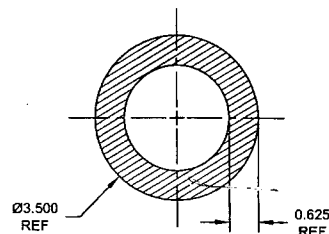
8 7 6 5 4 3 2 1



D412-664-603 10
BENDING AND DRILLING DETAIL E



C1-3 **VIEW D-D: CUFF DETAIL**
 SCALE 4X



SECTION C-C D5-3
 SCALE 4X

67057

RELEASED
 2009-10-29
 MP

| | | | |
|------------|----------|---|--------------|
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | Q | DRAWING NO. | REV. E |
| MFG. APPR. | AS | D412-664-243 | SHEET 3 OF 4 |
| APPROVED | AP | TITLE | SCALE |
| DE APPR. | H | CROSSTUBE ASSEMBLY (412 HI AFT) | NTS |
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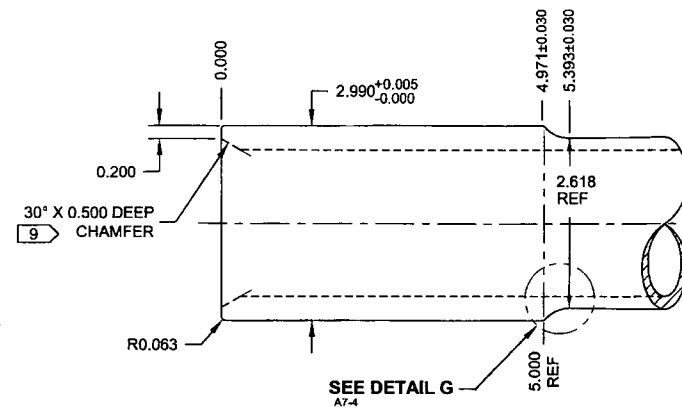
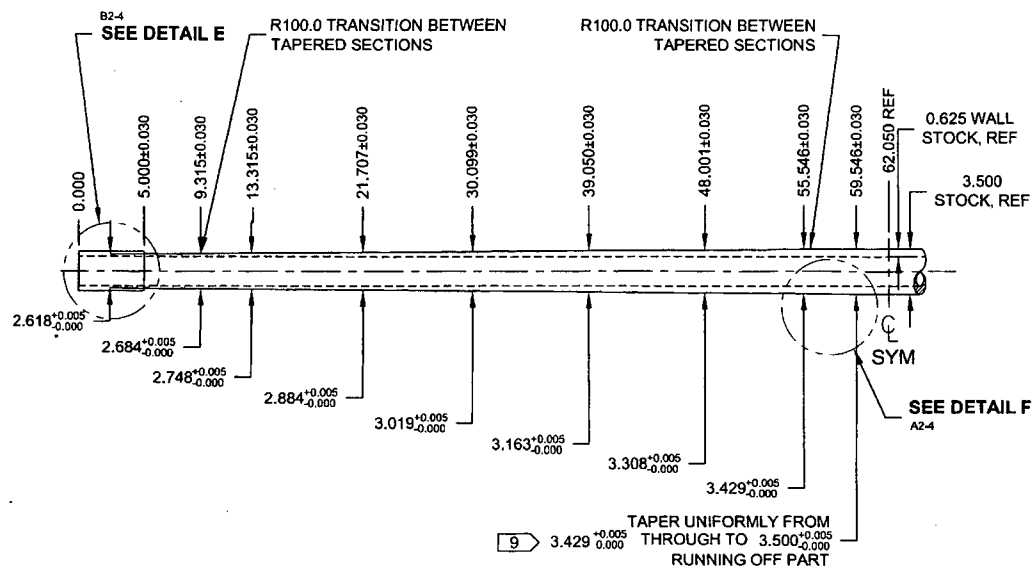
| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

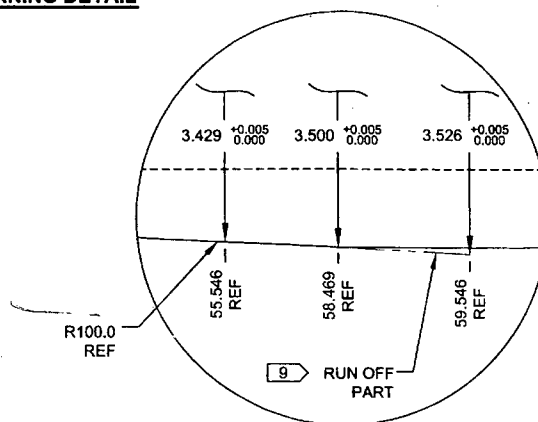
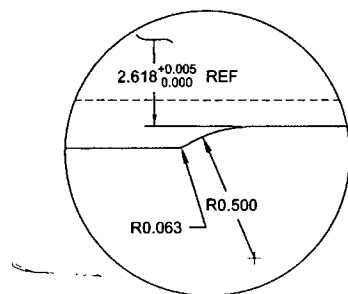
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
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NOTE: Date & initial all entries



D412-664-243TRN
TURNING DETAIL



67057

DETAIL F:
TAPER RUN-OFF C4-4
NOT TO SCALE

RELEASED
2009-10-29
MD

| | | | |
|--|----------|--|--------------|
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | 9 | DRAWING NO. | REV. E |
| MFG. APPR. | 18 | D412-664-243 | SHEET 4 OF 4 |
| APPROVED | 10 | TITLE | SCALE |
| DE APPR. | 14 | CROSSTUBE ASSEMBLY (412 HI AFT) | NTS |
| DATE | 09.09.30 | COPYRIGHT © 2001 BY DART AEROSPACE LTD | |
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| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

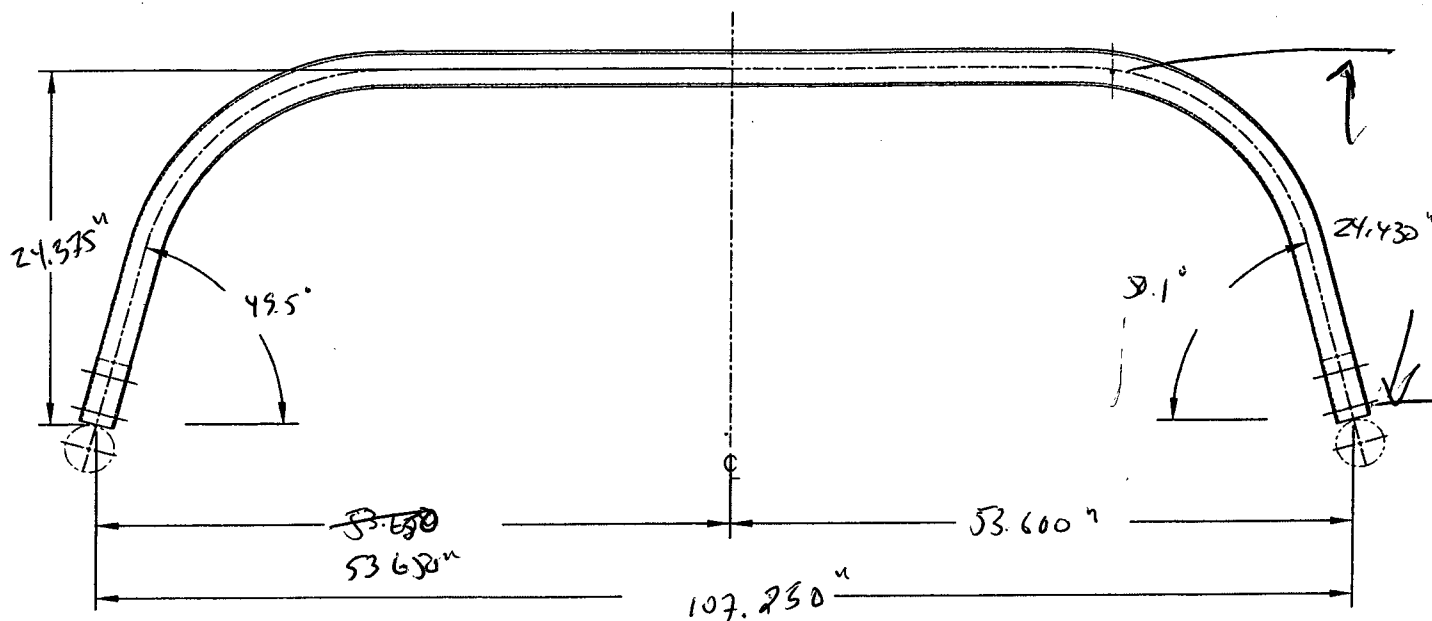
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

| | | | |
|---------------------------------------|--|--------------|--------------|
| DART AEROSPACE LTD | | Work Order: | 67057 |
| Description: Crosstube High Aft (412) | | Part Number: | D412-664-203 |
| Inspection Dwg: D412-664-243 Rev: E | | Page 1 of 1 | |

| Required Dimension | Min | Max |
|--------------------|--------|--------|
| Height | 24.24 | 24.50 |
| 1/2 Span | 53.59 | 53.85 |
| Angle | 49 | 52 |
| Total Span | 107.18 | 107.70 |



| Comments |
|----------|
| |
| |
| |
| |

| | |
|-----------------|----------|
| QC15 Inspection | 8 |
| Date | 11/03/12 |

| Rev | Date | Change | Revised by | Approved |
|-----|----------|-----------------------------------|------------|----------|
| A | 07.02.06 | New Issue | KJ/JM | |
| B | 07.05.08 | Dimensions updated per Dwg rev. D | KJ/JLM | |
| C | 10.02.02 | Dwg Rev updated | KJ | |



LIQUID PENETRANT TEST REPORT

P- 12230

| | | | | | |
|------------------|------------------------------|-----------------|-------------------------|-----------|--|
| CLIENT | <u>DART Aerospace</u> | DATE | <u>MARCH 18-2011</u> | PAGE | <u>1</u> OF <u>1</u> |
| ATTENTION | <u>LINDA LACELLE</u> | ACUREN JOB NO. | <u>188-11-02057</u> | TIME | AM <input checked="" type="checkbox"/> PM <input type="checkbox"/> |
| ADDRESS | <u>1270 ABELDEEN ST.</u> | PO/NO No. | <u>13681</u> | | |
| | <u>HAWKES BURY, ON.</u> | WORK LOCATION | <u>HAWKES BURY</u> | | |
| | <u>KGA 1K7</u> | ACCEPTANCE STD. | <u>ASTM 1417/AS-038</u> | REV./DATE | <u>2005</u> |
| PROJECT | <u>F.P.I. on CROSS TUBES</u> | | | | |
| ITEM(S) EXAMINED | <u>(4)</u> | | | | |

| | | |
|-----------------|---|--|
| JOB DESCRIPTION | PROCEDURE No. <u>LT-0002</u> REV./DATE <u>2008</u> | TECHNIQUE No. <u>LT-0002</u> REV./DATE <u>2008</u> |
| PART No. | <u>—</u> | |
| SCOPE | <u>WET FLUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL SURFACE.</u> | |
| | MATERIAL <u>ALUMINE ALUMINUM</u> | THICKNESS <u>VARIABLES</u> |

| | |
|--|--|
| TEST DETAILS | |
| METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE | <input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED |
| FAMILY BRAND <u>MAGNA FLUX</u> | BLACK LIGHT S/N <u>16459</u> <input checked="" type="checkbox"/> OUTPUT > 1000 μ W/cm ² <input type="checkbox"/> AMBIENT < 2 fc |
| PENETRANT <u>FL 67</u> MINIMUM DWELL TIME <u>45</u> MIN. | LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE |
| PENETRANT REMOVER <u>H2O</u> MINIMUM DRY TIME <u>>10</u> MIN. | OTHER <u>LABINO</u> |
| DEVELOPER <u>SKD 52</u> MINIMUM DWELL TIME <u>10</u> MIN. | LIGHT METER S/N <u>1098866</u> CAL DUE DATE <u>OCT-19</u> |
| DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY | <u>2011</u> |

| | |
|--|--|
| TEST SURFACE | |
| SURFACE CONDITION <input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED <input type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input checked="" type="checkbox"/> CLEAN BARE METAL | |
| SURFACE TEMPERATURE <input type="checkbox"/> < -4°C/20°F <input type="checkbox"/> -4°C/20°F TO 10°C/50°F <input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F | |

| | |
|---|-----------------|
| RESULTS- <input type="checkbox"/> METRIC <input checked="" type="checkbox"/> IMPERIAL | |
| 1 CROSS TUBE: W.O. <u>67057</u> ✓ | |
| 1 CROSS TUBE: W.O. <u>67058</u> ✓ | |
| 1 CROSS TUBE: W.O. <u>67055</u> ✓ | |
| 1 CROSS TUBE: W.O. <u>67056</u> ✓ | |
| | <u>11-03-21</u> |

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

| | | |
|--|--|----------------------|
| SIGNATURES | | DTR # <u>E-63247</u> |
| CLIENT REPRESENTATIVE <u>Zan Titley</u> | SIGNATURE <u>[Signature]</u> | |
| TECHNICIAN (SIGNATURE): <u>[Signature]</u> | | REPORT REVIEWED BY: |
| NAME (PRINT): <u>Mike Johnston</u> | 1 ST TECHNICIAN | NAME INITIALS |
| CGSB LEVEL <u>2</u> SNT LEVEL <u>—</u> | CGSB LEVEL <u>—</u> SNT LEVEL <u>—</u> | |
| CGSB REG. No <u>6606</u> | CGSB REG. No <u>—</u> | |

REFERENCE ONLY**5.0 PARTS LIST****5.1 HIGH GEAR CROSSTUBES**

| Item | -101 | -201 | -203 | Part Number | Description |
|------|------|------|------|------------------|--|
| | X | | | D212-664-101 | CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD |
| | | X | | D212-664-201 | CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT |
| | | | X | D412-664-203 | CROSSTUBE INSTALLATION, 412 HIGH AFT |
| 1 | 1 | | | D212-664-141 | CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD |
| 2 | | 1 | | D212-664-241 | CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT |
| 3 | | | 1 | D412-664-243 | CROSSTUBE ASSEMBLY, 412 HIGH AFT |
| 10 | 2 | | | * D2893-1 | SUPPORT |
| 11 | 4 | | | * D3595-063-450 | RUBBER CUSHION |
| 12 | 4 | | | * MS21920-25 | CLAMP (OR MS21042-26) |
| 13 | 4 | | | AN6-35A | BOLT |
| 14 | 4 | | | AN6-36A | BOLT |
| 15 | 6 | | | MS21042L6 | NUT (OR MS21042-6) |
| 16 | 18 | | | AN960JD616 | WASHER |
| 20 | | 2 | | * D2940-1 | SUPPORT |
| 21 | | 4 | | * D3595-063-530 | RUBBER CUSHION |
| 22 | | 4 | | * MS21920-28 | CLAMP (OR MS21042-30) |
| 23 | | 4 | | AN6-40A | BOLT |
| 24 | | 2 | | AN6-41A | BOLT |
| 25 | | 6 | | MS21042L6 | NUT (OR MS21042-6) |
| 26 | | 18 | | AN960JD616 | WASHER |
| 30 | | | 1 | * D2896-1 | SUPPORT |
| 31 | | | 2 | * D2856-600-1009 | ABRASION STRIP |
| 32 | | | 2 | * D3595-063-570 | RUBBER CUSHION |
| 33 | | | 4 | * MS21920-28 | CLAMP |
| 34 | | | 2 | * MS21920-30 | CLAMP (OR MS21042-32) |
| 35 | | | 4 | AN6-40A | BOLT |
| 36 | | | 2 | AN6-41A | BOLT |
| 37 | | | 6 | MS21042L6 | NUT (OR MS21042-6) |
| 38 | | | 18 | AN960JD616 | WASHER |
| 39 | | | 2 | * D3189-1 | CHAFING SHIELD |
| 50 | 1 | 1 | | D3428-1 | PLACARD |

*REFERENCE ONLY: PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
 NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
 SKIDTUBES.

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Revision: F
 Date: 08.09.05